COMMUNICATION DEVICE WITH TWO MODES OF OPERATION

The present invention relates generally to personal electrical communication devices and particularly to a mobile station which can transmit both speech and alphanumeric messages.

Mobile phones acting as cellular system terminal devices have rapidly become quite common, and we can assume that in the future almost everybody will have a communication device, which is suitable to be carried anywhere and with which it is possible to call other corresponding devices within the coverage area of the respective system, on a world-wide basis when required. For the present a major part of the mobile phones have been expressly telephones, or in the first place they were intended to transmit speech connections. In digital systems it has become possible to transmit also short alphanumeric messages between the mobile phones. Another story completely are the wire-connected combinations formed by a mobile phone, a data interface and a portable computer, which can be used to transmit through the cellular system any digital data processed by the computer.

From the publication "Portable Communication" by Peter E. Jackson and David A. Deas, Proceedings of the National Communications Forum, 42 (1988), Sept. 30, No. 2, Chicago, Ill., USA, it is known a personal message communication device according to FIG. **1**, where a device **1** resembling a modern mobile phone has both a numerical keypad **2** and an character keypad **3**. From the text of the publication it is evident that it expressly refers to a mobile terminal of a wide-area communication system, where the terminal can freely move within the coverage area of the system and where the system monitors the terminal's position so that it can correctly route calls to a certain terminal device. In said reference publication the device **1** is presented at an outline level, and there is no detailed description of its structure or functioning. The usability of the presented device is particularly complicated by the small size of the keypads, which obviously was used aiming at generally small overall dimensions.

From the patent publication U.S. Pat. No. 5,337,346 it is known a mobile phone having a numerical keypad which can be turned to one side, revealing a larger alphanumeric keypad below it. However, in such a solution the display of the device must be made so small that only a very short alphanumeric message will fit in it, in order to have a size which is at least reasonably readable. In said publication the object of the invention is said to be a mobile phone, which can include an electronic notebook function, and it is proposed that the power supply to the device's radio sections is switched off when the notebook function is used. Corresponding solutions are known from several television remote controls, whereby the user, by unfolding the outer covering of the device or a part of it, can enlarge that user interface, e.g. the keypad, of which only a small part is visible when the outer covering is closed.

The objective of this invention is to present a personal mobile station which can transmit information between users in a more flexible way than earlier. An objective of the invention is also to present a device of said type, which is easy to use and well suited as a mobile terminal of a cellular system. A further objective of the invention is to present a device which can transmit both voice and versatile graphical information between users.

The objectives of the invention are achieved by a device comprising the radio sections of a cellular system terminal and comprising two separate user interfaces, of which the first is intended for the transmission of telephone services and the second for the transmission of alphanumeric messages and other services requiring graphical information. The first user interface is located on the outer surface of the device and the second within the device, so that it can be exposed by unfolding the device in at least two parts, in a way intended for this purpose.

The portable communication device according to the invention is characterized in that it comprises a separate first user interface and a separate second user interface to realize the interaction between said communication device and the user, whereby said first user interface comprises first input means and first indicator means and said second user interface comprises second input means and second indicator means. The communication device of another embodiment according to the invention is characterized in that it comprises a separate first user interface and a separate second user interface to realize the interaction between said communication device and the user, whereby said first user interface is substantially a telephone user interface for the transmission of two-way speech and comprises a microphone, a speaker and first input means to control the operation of the device and to enter data into the device, and whereby said second user interface comprises second input means and indicator means.

During the development work leading to the invention we observed that when we continuously try to reduce the size of the mobile stations the small outer dimensions already begin to complicate the use of the devices. The user interface, or a certain entirety formed by parts which are designed for the interaction between a user and the device, should be designed so that regardless of the small size of the device itself a clumsy user, even with large hands, can manage the depression of buttons and other required operations without the training of a watchmaker. The disadvantages of the small size are particularly clearly seen in the device according to FIG. **1** representing the prior art and having buttons only a few millimeters wide and spaced about one millimeter from each other, judging from the size of the pencil which is shown to illustrate the scale.

The mobile station according to the invention has two separate user interfaces, which are independent regarding the use of the mobile station, i.e. they can be used independently of each other. The first user interface is located on the outer surface of the device and resembles the user interface of present-day mobile phones with a microphone, a speaker, a keypad and a small alphanumeric display. It is intended to be used in the same way as known user interfaces of present-day mobile phones. Because the whole outer surface of the device is available for the realization of this user interface, it can be made large enough so that it is easy to use. However, it is preferable that the keyboard and display means of the first user interface are located on only one side of the outer surface, so that they can be controlled with one glance. In order to use the second user interface the mobile station according to the invention can be opened by unfolding preferably two halves hinged to each other and having at their inner surfaces a larger display, a complete alphanumeric keypad and function keys, which then become visible and available to the user. A space with the size of two times the cross section of the device is available to realize the second user interface, whereby it also can be made large enough to make it easy to use, as was emphasized above.

Below the invention will be described in more detail with reference to the preferred embodiments shown as examples and to the enclosed figures, in which: